



1. DYNAMICS OF TREE-CROP INTERFACE IN RELATION TO THEIR INFLUENCE ON MICROCLIMATIC CHANGES—A REVIEW

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ABSTRACT: Integration of trees with crops adds a significant element of biological diversity to agronomic systems and promotes sustainable, protective and productive land use. The biological interactions between the major components i.e., trees and crops are of primary importance and introduce challenges and complexities not present in sole cropping. Specifically, it must be demonstrated that satisfactory growth and yields of both trees and crops can be achieved in the microenvironment of the agroforestry land-use system that varies considerably with time. Compared to an open environment, the modified microclimate under trees will have reduced solar radiation, a lowered red:far-red light ratio, a more moderate temperature regime, higher humidity, lower rates of evapo-transpiration and higher soil moisture levels. All of these factors will change as a function of tree development and tree management practices. The spacing arrangement chosen for trees will also be a factor in determining how rapidly the changes come into play. During the establishment phase, tree shade will be minimal and have little significant effect on the understory companion crops. However, as the trees grow, the changes in the microclimate will become more pronounced, which might strongly affect the growth and compatibility of the understory companion crop.

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2. SEED GERMINATION OF FRUIT CROPS : A REVIEW

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ABSTRACT: Seed germination is the resumption of active growth of embryo that results in the emergence of the young plant. Seeds of many fruit crops remain ungerminated even under favourable conditions. Such kind of dormancy in seeds may be due to presence of hard and impermeable seed coat, germination inhibitors or due to improper development of embryo. Such seeds may require special treatments like scarification, soaking in water, growth regulators etc. for overcoming dormancy. This review summarises the latest developments in seed germination in different fruits crops.

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3. RESPONSE OF BIO-ORGANIC NUTRITION ON GROWTH, YIELD AND QUALITY OF ASHWAGANDHA (*Withania somnifera* Dunal.)

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ABSTRACT : In an experiment conducted on ashwagandha (*Withania somnifera* Dunal), to study the response of different organic amendments with organic manure (FYM) and bio-fertilizers in relation to plant growth, root yield and quality parameters it was found that the seedlings (5-7 leaf stage) inoculated with *Azospirillum* @ 10⁵ or 10⁶ CFU resulted a significant increase in plant growth and biomass yield. However, the root and seed yields were observed higher in the plants planted in soil amended with vermi-compost and FYM @ 2 or 3 kg / 1.8 m² /plot. The plant height varied significantly among all the treated plots but remain taller (24.80 cm) in plots treated @ 2kg FYM having maximum stem diameter (0.48 cm) at 30 DAP (days after planting) and highest numbers of leaves per plant (438) after reaching 75 DAP followed by seedling treated with *Azospirillum* @ 10⁶ CFU. However, the lowest number of leaves per plant (97.4) was observed in the plants grown in plots amended vermi-compost @ 2kg / plot. Number of branches per plant remained highest (51.0) with plants treated with *Azospirillum* @ 10⁶ CFU, soil amended with vermi-compost @ 2kg and FYM @ 3 kg/ plot followed by plants grown with *Azospirillum* @ 10⁵ CFU (46.0). Whereas, the plants grown in plots amended without FYM produced least number of branches (21.2) even at 75 DAP. Fresh root weight per plant was observed maximum (24.0 g) in the plants amended with vermi-compost @ 2kg and FYM @ 3kg/plot and inoculated with *Azospirillum* @ 10⁶ CFU. However, the dry weight of the roots remained highest (7.6g /plant) in the plants treated with FYM @ 3kg , vermi-compost @ 2 kg / plot and inoculated with *Azospirillum* @ 10⁵ CFU.

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4. PATH ANALYSIS BETWEEN FRUIT YIELD AND SOME YIELD COMPONENTS IN TOMATO (*Lycopersicon esculentum* Mill)

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ABSTRACT : Path analysis was performed on plant and fruit characters of fifteen tomato genotypes grown in a two year field experiment to determine for fruit yield, the direct and indirect effects of the following traits: plant height, no. of primary branches/plant, no. of fruits/plant, fruit weight (g), fruit bearing length, fruit length, fruit width and pericarp thickness. Fruit yield per plant was positively and significantly correlated with pericarp thickness, fruit length, fruit weight and no. of fruits/plant, whereas, fruit yield per plant had negative and significant association with days to 50% flowering, plant height, no. of primary branches/plant, fruit bearing length. Path analysis showed that plant height, fruit length, fruit bearing length and pericarp thickness had positive direct effects on fruit yield while other traits under study had strong negative direct effects. The significant positive correlation coefficients of no. of fruits/plant with fruit yield was resulted from positive indirect effects of days to 50% flowering, fruit weight, fruit width and pericarp thickness, while for fruit weight with fruit yield, significant positive correlation resulted from positive indirect effects via days to 50% flowering, no. of fruits/plant and no. of primary branches/plant. Results suggest that indirect selection for days to 50% flowering, fruit weight, fruit width and direct selection for fruit bearing length and pericarp thickness should be primary selection criteria for improving fruit yield in tomato

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5. EFFECT OF CHEMICALS ON SHELF LIFE AND QUALITY OF GUAVA (*Psidium guajava*) FRUITS CV. APPLE COLOUR

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ABSTRACT: Guava cv. Apple colour is a commercial fruit crop for the grower in India but its self life is poor and its waste causes many economic problems. The aim of this study was to improve the self life of the fruit by the use of different chemicals composition, Waxol percentages and packaging materials. There were ten post harvest treatments—Bavistin (0%), (0.1%) and (2%) and Wax (0%), (6%) and (8%), and one storage condition i.e (Room temperature). Name of chemical use – Their effects were accessed by complete randomized design with three replications. The treated fruits of guava were stored at room temperature. There was decrease in vitamin C (mg) and acidity during storage period of guava fruit under room temperature. The increase in TSS and juice pH and physiological loss in weight of fruit was noticed in storage period irrespective of post harvest treatment and room temperature. All the treatments were found better in respect of TSS & ascorbic acid content over control. On the basis of results obtained the treatment combination T₄ (Waxol 6% + Bavistin 0.2%) proved to be the best in terms of fruit quality and better shelf life at room temperature.

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6. EFFECT OF ETHREL ON POST HARVEST CHANGES IN PAPAYA (*Carica papaya* L.) FRUITS

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ABSTRACT: The present experiment entitled, "Studies on the effect of ethrel on post harvest changes in papaya (*Carica papaya* L.) fruits was carried out to investigate the effect of ethrel on bio-chemical changes occurred during its post harvest life. The objective of this work was to evaluate the effects of various concentrations of Ethrel (500 ppm, 750 ppm, 1000 ppm and 1500 ppm) on shelf life of papaya fruits when stored under ambient conditions. The treated fruits were assessed for physiological changes such as percentage of ripening, loss of fruit weight (kg), biochemical aspects such as TSS (°Brix), titratable acidity (%), total sugars (%), reducing sugar (%), ascorbic acid content (mg/100g), total carotenoids (mg/100g) along with organoleptic evaluation. The observations were recorded at 3, 6 and 9 days after storage and the experiment was laid down using Completely Randomized Design. From the experiment it was clear that the overall performance of the above characteristics was found the best when the fruits were treated with 1500 ppm ethrel followed by 1000 ppm ethrel.

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7. FRUIT YIELD AND QUALITY OF PEACH (*Prunus persica* Batsch.) AS INFLUENCED BY DIFFERENTIAL APPLICATION OF ZINC

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ABSTRACT: The data revealed that fruit yield of peach increased with increasing application of zinc sulphate. The maximum fruit size (5.0 cm length and 4.9 cm breadth), fruit weight (89.00g), fruit yield per plant (58.25 kg) and yield per unit area (64.07 q/hectare) were observed with 800 g ZnSO₄ per plant as soil application followed by foliar spray (0.5%) whereas minimum yield was obtained without zinc application. Zinc application also improved total soluble solids (TSS) and TSS: acid ratio. However, acidity of fruits obtained from treated and untreated plants was not differ significantly but the highest acid content was observed in control plants, whereas lowest was in foliar application of 0.50 % ZnSO₄. Fruits were also more palatable in Zinc applied plants. The highest concentration of zinc (11.55 ppm) in leaves was observed at higher doses of soil zinc application and was in lowest in control plants.

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8. EXTENDING HARVESTING PERIOD OF LITCHI (*Litchi chinensis* Sonn.) THROUGH CHEMICALS APPLICATION

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ABSTRACT: An experiment was conducted to stagger the harvesting of litchi in cultivar Rose Scented. In this regard, various kinds of treatments were imposed on 20 years old full bearing litchi trees either at flower initiation or few days before harvest of fruits. KNO₃ (4%) was sprayed at 1 cm size of panicle in the first week of February. However, other treatments viz. GA₃ (20, 40 ppm), BA (20, 40 ppm) and bagging of fruit panicles were applied two weeks before expected date of harvest, while silver thiosulphate (10 m mol) sprayed twice (on 30th April and 15th May). Shading treatments were given by covering the tree with nylon nets producing 30% and 50% shade, respectively, 30 days after fruit set. KNO₃ (4%) and cluster bagging treatments advanced the harvesting for 2 and 3 days, respectively over control. Shade nets of 30% and 50% were most effective in delaying ripening of litchi fruits and delayed the harvest date by 14 and 16 days, respectively without compromising with the fruit quality. Silver thiosulphate gave a harvest delay of 8 days, however, a few brown spots on fruit skin were observed after the spray. GA₃ 20 and 40 ppm delayed the harvest date for 2 and 5 days, respectively while BA delayed the harvest date for 5-6 days. Higher fruit retention and reduced fruit cracking were obtained with shade net (50%) which was remained at par with shade net (30%) and cluster bagging. Higher fruit quality attributes were recorded with GA₃ (40 ppm) over other treatments.

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9. INTERACTION EFFECT OF CHEMICAL AND BIO-FERTILIZERS ON GROWTH AND YIELD OF ONION (*Allium cepa* L.)

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ABSTRACT : The present investigation comprising the supplementation of chemical and biofertilizers for onion crop was carried out under field conditions at Horticultural Research Farm of Babasaheb Bhimrao Ambedkar University, Lucknow during *rabi* season of 2010-2011. The experiment comprised of four levels of chemical fertilizers and six levels of biofertilizers. The maximum plant heights, number of leaves, neck thickness, bulb diameter, bulb weight, number of scales and yield were found with the application of T₁₂ (100 kg N + 50 kg P + 70 kg K/ha + 2 kg/ha *Azotobacter* + 1.9 kg/ha VAM) that was closely followed by T₁₁ (100 kg N + 50 kg P + 70 kg K/ha + 2 kg/ha *Azotobacter* + 2 kg/ha *Phosphobacteria*), T₁₈ (75 kg N +37.5 kg P + 52.5 kg K/ha + 2 kg/ha *Azotobacter* + 1.9 kg/ha VAM) and T₁₇ (75 kg N +37.5 kg P + 52.5 kg K/ha + 2 kg/ha *Azotobacter* + 2 kg/ha *Phosphobacteria*) respectively. Minimum number of days required for bulb formation and number of days taken to maturity were also obtained with the application of T₁₂ (100 kg N + 50 kg P + 70 kg K/ha + 2 kg/ha *Azotobacter* + 1.9 kg/ha VAM). Results obtained by the application of inorganic fertilizers with biofertilizers exhibited significant effect on various parameters studied under the investigation.

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10. INTEGRATED NUTRIENT MANAGEMENT IN GARDEN PEA (*Pisum sativum* var. *hortense*)

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ABSTRACT: An experiment was conducted to find out the effect of integrated nutrient management in garden pea (*Pisum sativum* var. *hortense*). The results indicated that application of vermicompost @ 1 t ha⁻¹ + rest PK (50:25 kg ha⁻¹) through chemical fertilizers with variety Azad Pea-3 resulted maximum height of plant (59.40 cm), number of pods plant⁻¹ (8.46), weight of pods plant⁻¹ (41.22g), shelling percentage (50.66%) and yield of green pod (126.54 qha⁻¹). On the basis of cost of cultivation, maximum net return of Rs. 44392/ ha and C.B. ratio (1:2.93) was recorded under Azad Pea-3 with the application of vermicompost @ 1 t ha⁻¹ + rest PK (50:25 kg ha⁻¹) and next best treatment was FYM @ 3 t ha⁻¹ + rest PK (48:10 kg ha⁻¹) in the same variety which gave Rs. 41796/ ha with C:B ratio 1:2.57.

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11. GENETIC VARIABILITY, HERITABILITY AND CORRELATION STUDIES IN CHILLI

(*Capsicum annuum* L.)

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ABSTRACT: Genetic variability, heritability, genetic advance and correlation for different yield contributing characters were studied in 20 genotypes of chilli. Significant differences were observed among the genotypes for all the traits. The phenotypic coefficient of variation (PCV) was higher than genotypic coefficient of variation (GCV) for all the traits. Traits like number of branches at 150 DAT, days to flower anthesis, number of fruits per plant, average fruit weight, ascorbic acid, capsaicin content and fruit length showed positive correlation with fruit yield per plant (g). While leaf curl incidence showed negative correlation at genotypic level. Genetic advance at 5% was found high for plant height after 150 DAT, number of fruits per plant, ascorbic acid and fruit yield per plant (g). Whereas, genetic advance as per cent of mean at 5% was noticed high for all the traits except days to flower initiation and days to first harvest. Number of fruits per plant exhibited the highest positive direct effect followed by days to flower anthesis, plant spread (N-S) at 150 DAT, ascorbic acid content, plant height at 150 DAT and fruit length at genotypic level. In view at the direct and indirect contributions of component traits towards fruit yield per plant, selection on the basis of horticultural traits viz., average fruit weight and number of fruits per plant would be a paying preposition in the genotypes included in the study.

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12. EFFECT OF CALCIUM NITRATE ON PHYSICO-CHEMICAL CHANGES AND SHELF-LIFE OF AONLA (*Emblca officinalis* Gaertn) FRUITS

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ABSTRACT : The experiment was conducted at the Department of Horticulture, C.S.A. University of Agriculture and Technology, Kanpur during the year 2006-07 to find out effect of calcium nitrate on physico-chemical changes and shelf-life of aonla fruit. Completely Randomized Design (CRD) was selected with four treatments of calcium nitrate (0.5, 1.0 and 1.5 per cent with control) and four other treatments of cultivars (Banarasi, Krishna, Kanchan and NA-7) and 5 days, 10 days and 15 days of storage period. Experiments unit was 1 kg fruit in perforated polythene bags. Fruits were treated and stored on 17 November, 2006. As regards among the treatments tried as post-harvest dip at 1.0 per cent calcium nitrate treatment proved most effective in respect to increase physico-chemical qualities and shelf-life of aonla fruits. The 1.0 per cent calcium nitrate treated fruits significantly reduced the physiological loss in weight, pathological loss, exhibited better quality on account of its favourable effect on total soluble solids, total sugar and in retaining more ascorbic acid and acidity thereby rendering them acceptable upto period of 15 days. Different cultivars could keep well up to 5 days with 'Excellent' rating, 10 days with 'Good' rating while only NA-7 and Krishna with 'Fair' rating upto 15 days.

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13. EVALUATION OF IVY GOURD (*Coccinia cordifolia* L.) GENOTYPES IN ALLAHABAD AGRO-CLIMATIC CONDITION

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ABSTRACT: An evaluation trial on ivy gourd (*Coccinia cordifolia* L.) genotypes in Allahabad agro climatic condition was conducted at vegetable research farm, Department of Horticulture, SHIATS Allahabad for 16 characters *i.e.* days to first female flower anthesis, plant height, internodal length, petiole length, fruit length, fruit diameter, average fresh fruit weight, number of seeds/fruit, number of fruits per plant, yield per plant, yield per hectare, TSS (°Brix) and ascorbic acid content. Eight genotypes of ivy gourd, namely Arka Neelachal Sabuja, Arka Neelachal Kunkhi, AAIIG – 1, AAIIG – 2, AAIIG – 3, AAIIG – 4, AAIIG – 5 and AAIIG – 6 were evaluated in randomized block designed in three replication during 2011. The genotype AAIIG – 1 and Arka Neelachal Sabuja showed minimum days to female flower anthesis. The highest fruit length and fruit diameter were obtained by Arka Neelachal Kunkhi and AAIIG – 1, respectively and maximum fruit weight was exhibited by genotypes AAIIG – 1. The most promising genotype was AAIIG – 1 for maximum number of fruit per plant and fruit yield per plant followed by Arka Neelachal Sabuja.

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14. STUDY ON POST-HARVEST LIFE OF CUT ROSE CV. FIRST RED AS AFFECTED BY DIFFERENT CHEMICALS AND WRAPPING MATERIALS

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ABSTRACT: An investigation was carried out to find the effect of different chemicals as pulsing solutions (CaCl_2 1%, Sucrose 5% + 8HQC 150 ppm, Sucrose 3% + $\text{Al}_2(\text{SO}_4)_3$ 300 ppm for duration of 20 and 24 h) and wrapping materials (Newspaper, Butter paper and Cellophane sheet for duration of 16 h) on the quality and vase life of cut rose cv. First Red. Results obtained show that all treatments performed better than that of control. Among all the treatments, A_2C_2 (cut rose pulsed with Sucrose 5% + 8HQC 150 ppm for 20 h and packaged with Butter paper for 16 h) recorded the maximum increase in quality and vase life of 12.34 days. Whereas the treatments A_2C_0 (pulsed with Sucrose 5% + 8HQC 150 ppm for 20 h only) and A_0C_2 (packaged with Butter paper for 16 h only) recorded a vase life of 11.13 days and 11.02 days, respectively. However, in control treatment (A_0C_0) the vase life recorded was 8.53 days.

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15. FABA BEAN: UNIQUE GERMPLASM EXPLORED AND IDENTIFIED

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ABSTRACT: The germplasm contains promising traits related to yield and yield attributing characters, quality characters and also resistance to various biotic and abiotic stresses. Exploration for collection of germplasm of diverse nature is the quickest and simplest method for acquiring the desired one. 71 accessions of faba bean were collected from Bihar and evaluated. Unique germplasm explored and identified and notable among them are salt resistant lines explored and collected from Vaishali district of Bihar. One germplasm line having four pods per pod and another one bear fruits right from collar region were identified during the course of characterizations and evaluation. These promising and unique accessions will be used by breeders/ crop improvement workers in the country for its evaluation and further utilization in their ongoing/ensuing crop improvement works for strengthening food and nutritional security of country.

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16. RESPONSE OF DIFFERENT SPACING AND SALICYLIC ACID LEVELS ON GROWTH AND FLOWERING OF GLADIOLUS (*Gladiolus grandiflora* L.)

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ABSTRACT: An experiment was conducted to assess the effect of spacing and salicylic acid levels on vegetative growth and flowering of gladiolus cv. White Prosperity at HRC, SVPUAT, Meerut. The three levels of spacing (20 x 10, 20 x 20, and 20 x 30 cm) and three levels of salicylic acid (0, 50 and 100 ppm) were used in randomized block design (RBD) with three replications. Out of these a optimum spacing 20 x 20 cm was found superior with 100 ppm salicylic acid concentration in respect of number of leaves, leaf length (cm), days to opening of 1st floret and visibility of first spike, spike length, and number of florets per spike. .

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17. ECONOMICS OF PRODUCTION AND MARKETING OF OKRA IN DISTRICT BIJNOR (U.P.)

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ABSTRACT: Bhindi (Okra) is an important vegetable crop of district Bijnor. It provides a net income of Rs. 7794.78 with a gross output value of Rs. 21000.00 with a total input of Rs. 13205.22. The cost : benefit ratio was calculated at 1:1.59. In the marketing of Bhindi(okra) the producer's share in the price paid by the consumer was very low being only 56.41 per cent due to inefficient marketing. A sound production and marketing system of vegetables in general and that of *Bhindi* (okra) in particular are needed.

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Research Note :

18. IDENTIFICATION OF FABA BEAN (*Vicia faba* L.) LINES SUITABLE FOR RAINFED AND IRRIGATED SITUATION

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19. EFFECT OF FOLIAR APPLICATION OF ZINC AND BORON ON YIELD AND FRUIT QUALITY OF GUAVA (*Psidium guajava* L.)

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20. RESPONSE OF GIBBERELIC ACID ON GROWTH BEHAVIOUR AND MENTHOL OIL YIELD OF MENTHA (*Mentha piperita* L.)

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21. RESPONSE OF GERBERA VARIETIES AGAINST POWDERY MILDEW DISEASE UNDER POLYHOUSE CONDITION

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